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10/811,642	03/29/2004	James A. Mott	SUN-P8932	2376

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EXAMINER	
VU, THONG H	

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2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,642	MOTT ET AL.	
	Examiner	Art Unit	
	Thong H. Vu	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Claims 1-42 are pending.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-42 are rejected on the ground of nonstatutory double patenting over claims 1-54 of U. S. Patent No. 7,142,540 ('540) since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows:

('540)1. A method of reassembling a payload of a packet received from a communication link, comprising:
receiving a first packet at a communication interface;
identifying a first connection associated with the first packet, wherein the first connection includes a host computing device coupled to the communication interface;
for each of multiple connections (i.e.: multi queues), including the first connection, maintaining a list of host buffers for storing payloads of packets associated with the connections;

separating a payload portion of the first packet from a header portion of the first packet;
mapping (i.e.: assemble) a sequence number of the payload portion to a first host buffer allocated to the first connection;
and initiating a transfer (i.e.: forwarding, transmit, Read, Send) of the payload portion from the communication interface to the first host buffer via DMA (Direct Memory Access).
19. The method of claim 1, further comprising after said receiving a first packet: receiving a second packet of the first connection; mapping a payload portion of the second packet to a host buffer; and if a sequence number of the initial byte of the payload portion of the second packet is consecutive to the sequence number of the last byte of the payload portion of the first packet, writing the payload portion of the second packet contiguous to the payload portion of the first packet via DMA.
26. The method of claim 1, wherein said first packet is forwarded to the host computing device via encapsulation if said mapping is unsuccessful.
48. The apparatus of claim 46, wherein the apparatus is coupled to the first host computing device by an Infiniband interconnect (i.e.: RDAM Read/write operations).

(Application) 1. A method of queuing InfiniBand receive traffic, comprising:
queuing one or more InfiniBand Send commands in a queue, wherein each said Send command comprises an encapsulated communication;
queuing a set of InfiniBand RDMA Read descriptors in said queue;
selecting an entry in said queue, wherein said entry comprises a Send command or a set of said RDMA Read descriptors;
if said selected entry is a set of said RDMA Read descriptors:
issuing a set of RDMA Read requests to retrieve portions of a communication described by said RDMA Read descriptors; and
as RDMA Read responses are received in response to said RDMA Read requests, assembling said described communication in said queue; and
forwarding a communication associated with said selected entry, for transmission on an external communication link, wherein said communication is one of:
said encapsulated communication if said selected entry is a Send command; and
said described communication if said selected entry is a set of RDMA Read descriptors.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See also MPEP § 804.

Claim Rejections - 35 USC § 102

Claim 29 is rejected under 35 U.S.C. 102(e) as being anticipated by Boyd et al [Boyd 2006/0259644 A1].

3. As per claim 29, Boyd discloses An apparatus for queuing multiple types of receive traffic in a communication interface [Boyd, the management of receive queues, abstract], comprising:

a queue for queuing multiple types of receive traffic commands, wherein each said command is associated with a communication to be transmitted from the communication interface [Boyd, three different transport types, 0009];

a head pointer configured to identify a head of said queue; a tail pointer configured to identify a tail of said queue, wherein said traffic commands are enqueued at said tail [Boyd, head pointer, 0122; tail pointer, 0129,0132]; and

a next entry pointer configured to identify a next entry in said queue to be processed [Boyd, next entry, 0132].

Claim Rejections - 35 USC § 103

Claims 1-28,30-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al [Boyd 2006/0259644 A1] in view of Burton et al [Burton 7,107,359 B1].

4. As per claim 1, Boyd discloses A method of queuing InfiniBand receive traffic [Boyd, the management of receive queues, abstract], comprising:

queuing one or more InfiniBand Send commands in a queue, wherein each said Send command comprises an encapsulated communication [Boyd, send and receive queue pairs, 0047; encapsulated, 0051];

selecting an entry in said queue, wherein said entry comprises a Send command (or a set of said RDMA Read descriptors) [Boyd, the number of SACK entries selected by the Modify QP verb, 0138];

However Boyd does not explicitly detail

queuing a set of InfiniBand RDMA Read descriptors in said queue; if said selected entry is a set of said RDMA Read descriptors: issuing a set of RDMA Read requests to retrieve portions of a communication described by said RDMA Read descriptors; and

as RDMA Read responses are received in response to said RDMA Read requests, assembling said described communication in said queue; and

forwarding a communication associated with said selected entry, for transmission on an external communication link, wherein said communication is one of said encapsulated communication if said selected entry is a Send command; and said described communication if said selected entry is a set of RDMA Read descriptors.

In the same endeavor, Burton discloses RDMS read/write descriptors [Burton, col 8 line 56-col 9 line 17, Fig 3D]; assembling said described communication in said queue [Burton, assembled for transmission, col 24 line 53-col 25 line 60]; forwarding a communication [Burton, forwarding database, col 6 line 2]

Therefore it would have been obvious to an ordinary skill in the art at the time the invention was made to incorporate the RDMA Read operations with descriptors, assembled for transmission and forwarding database as taught by Burton into the Boyd's apparatus in order to utilize the RDMA operations.

Doing so would provide a better performance and optimize for Infiniband functionality including controlling execution with minimal pipeline and packet processing with minimal latency [Burton, col 2 lines 25-30].

5. As per claim 2, Boyd-Burton disclose maintaining a single memory structure for queuing InfiniBand traffic received via multiple virtual lanes and multiple queue pairs, said single memory structure comprising said queue [Boyd, a single IP suite Offload engine, 0068; virtual addresses and virtual memory protection mechanism, 0064].

6. As per claim 3, Boyd-Burton disclose said queue comprises one or more linked lists of memory buffers within said single memory structure [Boyd, link list, 0129].

7. As per claim 4, Boyd-Burton disclose maintaining an assembly area of said queue, in which said described communication is assembled [Burton, assembled, col 24 line 53-col 25 line 60]; and maintaining a queuing area of said queue, in which said one or more Send commands and said set of RDMA Read descriptors are queued [Burton descriptors, col 8 lines 14-38].

8. As per claim 5, Boyd-Burton disclose said RDMA Read responses are placed directly into said assembly area upon receipt [Boyd, read directly, 0062].

9. As per claim 6, Boyd-Burton disclose if said selected entry is a set of RDMA Read descriptors appending space to said assembly area of said queue based on an expected size of said described communication [Burton, descriptor and assembled, col 25 lines 5-30].

10. As per claim 7, Boyd-Burton disclose maintaining a first head pointer configured to identify a head of said assembly area of said queue; maintaining a first tail pointer

configured to identify a tail of said assembly area of said queue; maintaining a second head pointer configured to identify a head of said queuing area of said queue; maintaining a second tail pointer configured to identify a tail of said queuing area of said queue; and maintaining a next entry pointer configured to identify a next entry in said queue to be processed after said forwarding [Boyd, head pointer, 0122; tail pointer, 0129,0132].

11. As per claim 8, Boyd-Burton disclose said first head pointer is further configured to identify a beginning of said communication [Boyd, head pointer, 0122; tail pointer, 0129,0132].

12. As per claim 9, Boyd-Burton disclose said second tail pointer is configured to identify where in said queue a next Send command or set of RDMA Read descriptors is to be queued [Boyd, head pointer, 0122; tail pointer, 0129,0132].

13. As per claim 10, Boyd-Burton disclose maintaining a set of pointers configured to identify a beginning and an end of said communication [Boyd, head pointer, 0122; tail pointer, 0129,0132].

14. As per claim 11, Boyd-Burton disclose said set of pointers includes a head pointer configured to identify a head of said queue [Boyd, head pointer, 0122; tail pointer, 0129,0132].

15. As per claim 12, Boyd-Burton disclose said assembling comprises dropping an RDMA Read response received out of order [Burton, assemble, col 24 line 53-col 25 line 60].

16. As per claim 13, Boyd discloses A computer readable medium storing instructions that, when executed by a computer, cause the computer to perform a method of queuing InfiniBand receive traffic [Boyd, the management of receive queues, abstract], the method comprising:

queuing one or more InfiniBand Send commands in a queue, wherein each said Send command comprises an encapsulated communication [Boyd, send and receive queue pairs, 0047; encapsulated, 0051];

selecting an entry in said queue, wherein said entry comprises a Send command (or a set of said RDMA Read descriptors) [Boyd, the number of SACK entries selected by the Modify QP verb, 0138];

However Boyd does not explicitly detail

queuing a set of InfiniBand RDMA Read descriptors in said queue; if said selected entry is a set of said RDMA Read descriptors: issuing a set of RDMA Read requests to retrieve portions of a communication described by said RDMA Read descriptors; and as RDMA Read responses are received in response to said RDMA Read requests, assembling said described communication in said queue; and

forwarding a communication associated with said selected entry, for transmission on an external communication link, wherein said communication is one of:
said encapsulated communication if said selected entry is a Send command; and
said described communication if said selected entry is a set of RDMA Read descriptors.

In the same endeavor, Burton discloses RDMS read/write descriptors [Burton, col 8 line 56-col 9 line 17, Fig 3D]; assembling said described communication in said queue

[Burton, assembled for transmission, col 24 line 53-col 25 line 60]; forwarding a communication [Burton, forwarding database, col 6 line 2]

Therefore it would have been obvious to an ordinary skill in the art at the time the invention was made to incorporate the RDMA Read operations with descriptors, assembled for transmission and forwarding database as taught by Burton into the Boyd's apparatus in order to utilize the RDMA operations.

Doing so would provide a better performance and optimize for Infiniband functionality including controlling execution with minimal pipeline and packet processing with minimal latency [Burton, col 2 lines 25-30].

17. As per claim 14, Boyd-Burton disclose maintaining an assembly area of said queue, in which said described communication is assembled; and maintaining a queuing area of said queue, in which said one or more Send commands and said set of RDMA Read descriptors are queued [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

18. As per claim 15, Boyd-Burton disclose if said selected entry is one of said RDMA Read commands: appending space to said assembly area of said queue based on an expected size of said described communication [Burton, descriptor and assembled, col 25 lines 5-30].

19. As per claim 16, Boyd-Burton disclose maintaining a first head pointer configured to identify a head of said assembly area of said queue [Boyd, head pointer, 0122; tail pointer, 0129,0132]; maintaining a first tail pointer configured to identify a tail of said assembly area of said queue [Burton, assembled for transmission, col 24 line 53-col 25

line 60]; maintaining a second head pointer configured to identify a head of said queuing area of said queue; maintaining a second tail pointer configured to identify a tail of said queuing area of said queue; and maintaining a next entry pointer configured to identify a next entry in said queue to be processed after said forwarding [Burton, forwarding database, col 6 line 2].

20. As per claim 39, Boyd discloses A method of maintaining ordering of transmission of outbound communications from an InfiniBand channel adapter [Boyd, the management of receive queues, abstract], the method comprising:

receiving on a first queue pair a first InfiniBand packet payload comprising a set of RDMA (Remote Direct Memory Access) Read descriptors describing a first communication [Boyd, the number of SACK entries selected by the Modify QP verb, 0138];

However Boyd does not explicitly detail

after receiving said first InfiniBand packet, receiving on the first queue pair a second InfiniBand packet payload comprising a portion of a second communication; after receiving said second InfiniBand packet, processing said first InfiniBand packet payload by dispatching RDMA Read requests corresponding to said set of RDMA Read descriptors;

receiving responses to said RDMA Read requests, said responses comprising portions of the first communication; assembling the first communication; and transmitting the first communication from the channel adapter; and only after said processing said first InfiniBand packet, processing said second InfiniBand packet.

In the same endeavor, Burton discloses RDMS read/write descriptors [Burton, descriptors, col 8 line 56-col 9 line 17, Fig 3D]; assembling said described communication in said queue [Burton, assembled for transmission, col 24 line 53-col 25 line 60]; forwarding a communication [Burton, forwarding database, col 6 line 2]; a scheduler [Burton, scheduler, col 14 lines 22-29] it's clearly that by using a scheduler for the next virtual interface would provide a first and second queue pair and first and second communication.

Therefore it would have been obvious to an ordinary skill in the art at the time the invention was made to incorporate the RDMA Read operations with descriptors, assembled for transmission and forwarding database as taught by Burton into the Boyd's apparatus in order to utilize the RDMA operations.

Doing so would provide a better performance and optimize for Infiniband functionality including controlling execution with minimal pipeline and packet processing with minimal latency [Burton, col 2 lines 25-30].

21. As per claim 40, Boyd-Burton disclose said processing said second InfiniBand packet comprises transmitting the second communication from the channel adapter [Burton, channel adapters, col 5 line 1].

22. As per claim 41, Boyd-Burton disclose said receiving a first InfiniBand packet payload comprises queuing said first InfiniBand packet payload in a first portion of a queue associated with the first queue pair; and said receiving a second InfiniBand packet payload comprises queuing said second InfiniBand packet payload in the first portion of the queue [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

23. As per claim 42, Boyd-Burton disclose assembling said portions of the first communication in a second portion of the queue [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

24. As per claim 17, Boyd discloses A method of queuing multiple types of traffic in a receive queue of a communication interface [Boyd, the management of receive queues, abstract; three different transport types, 0009], the method comprising:

However Boyd does not explicitly detail

queuing a first entry comprising a first communication forwarded to the communication interface by a host;

queuing a second entry comprising a set of descriptors configured to describe a second communication stored on the host;

processing said first entry, wherein processing said first entry comprises: determining whether said first communication is complete; and forwarding said first communication to a communication module for transmission; and

processing said second entry, wherein processing said second entry comprises: issuing requests to obtain portions of said second communication described by said descriptors; assembling said second communication in said queue ; and forwarding said second communication to the communication module for transmission.

In the same endeavor, Burton discloses RDMS read/write descriptors [Burton, descriptors, col 8 line 56-col 9 line 17, Fig 3D]; assembling said described communication in said queue [Burton, assembled for transmission, col 24 line 53-col 25

line 60]; forwarding a communication [Burton, forwarding database, col 6 line 2];]; a scheduler [Burton, scheduler, col 14 lines 22-29] it's clearly that by using a scheduler for the next virtual interface would provide a first and second entry and first and second communication.

Therefore it would have been obvious to an ordinary skill in the art at the time the invention was made to incorporate the RDMA Read operations with descriptors, assembled for transmission and forwarding database as taught by Burton into the Boyd's apparatus in order to utilize the RDMA operations.

Doing so would provide a better performance and optimize for Infiniband functionality including controlling execution with minimal pipeline and packet processing with minimal latency [Burton, col 2 lines 25-30].

25. As per claim 18, Boyd-Burton disclose processing said second entry further comprises determining whether said second communication has been fully assembled [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

26. As per claim 19, Boyd-Burton disclose maintaining a queuing area for queuing Send commands; and maintaining an assembly area for assembling said second communication from said portions of said second communication [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

27. As per claim 20, Boyd-Burton disclose placing said portions of said second communication directly into said assembly area upon receipt [Boyd, directly read, 0062].

As per claim 21, Boyd-Burton disclose forwarding a previous communication to the

communication module; and selecting whichever of said first entry and said second entry has been queued for the longest time [Boyd, the number of entries, 0138].

28. As per claim 22, Boyd-Burton disclose advancing a next entry pointer to the next entry in the receive queue [Boyd, the next entry, 0132].

29. As per claim 23, Boyd-Burton disclose reading a portion of a payload of said next entry to determine a traffic type of said next entry [Boyd, the next entry, 0132].

30. As per claim 24, Boyd-Burton disclose a set of linked memory buffers within a single memory structure configured as queues for one or more InfiniBand queue pairs [Boyd, link list, 0129].

31. As per claim 25, Boyd-Burton disclose appending one or more free memory buffers of the single memory structure to the receive queue; wherein said assembling comprises assembling said second communication in said one or more memory buffers [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

32. As per claim 26, Boyd discloses A computer readable medium storing instructions that, when executed by a computer, cause the computer to perform a method of queuing multiple types of traffic in a receive queue of a communication interface [Boyd, the management of receive queues, abstract; three different transport types, 0009], the method comprising:

However Boyd does not explicitly detail

queuing a first entry comprising a first communication forwarded to the communication interface by a host;

queuing a second entry comprising a set of descriptors configured to describe a second communication stored on the host;

processing said first entry, wherein processing said first entry comprises: determining whether said first communication is complete; and forwarding said first communication to a communication module for transmission; and processing said second entry, wherein processing said second entry comprises:

issuing requests to obtain portions of said second communication described by said descriptors;

assembling said second communication in said queue; and forwarding said second communication to the communication module for transmission.

In the same endeavor, Burton discloses RDMS read/write descriptors [Burton, descriptors, col 8 line 56-col 9 line 17, Fig 3D]; assembling said described communication in said queue [Burton, assembled for transmission, col 24 line 53-col 25 line 60]; forwarding a communication [Burton, forwarding database, col 6 line 2];]; a scheduler [Burton, scheduler, col 14 lines 22-29] it's clearly that by using a scheduler for the next virtual interface would provide a first and second entry and first and second communication.

Therefore it would have been obvious to an ordinary skill in the art at the time the invention was made to incorporate the RDMA Read operations with descriptors, assembled for transmission and forwarding database as taught by Burton into the Boyd's apparatus in order to utilize the RDMA operations.

Doing so would provide a better performance and optimize for Infiniband functionality including controlling execution with minimal pipeline and packet processing with minimal latency [Burton, col 2 lines 25-30].

33. As per claim 27, Boyd-Burton disclose maintaining a queuing area for queuing Send commands; and maintaining an assembly area for assembling said second communication from said portions of said second communication [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

34. As per claim 28, Boyd-Burton disclose placing said portions of said second communication directly into said assembly area upon receipt [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

35. As per claim 30, Boyd-Burton disclose said queue comprises an assembly area for assembling a communication associated with a first type of receive traffic command [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

36. As per claim 31 Boyd-Burton disclose a queuing area for queuing a second type of receive traffic command [Boyd, a queue pair is set to provide a selected type of transport service, 0082].

37. As per claim 32, Boyd-Burton disclose said assembly area and said queuing area are each delimited by a head pointer and a tail pointer [Boyd, head pointer, 0122; tail pointer, 0129,0132].

38. As per claim 33, Boyd-Burton disclose said first type of receive traffic command is an InfiniBand Send command comprising a set of RDMA read descriptors configured

to identify the communication associated with said first type of receive traffic command [Burton, descriptors, col 8 line 56-col 9 line 17, Fig 3D].

39. As per claim 34, Boyd-Burton disclose a second type of receive traffic command is an InfiniBand Send command configured to encapsulate the communication associated with said second type of receive traffic command [Boyd, encapsulated, 0051].

40. As per claim 35, Boyd-Burton disclose said first type of receive traffic command comprises a set of descriptors, wherein each said descriptor is configured to describe a portion of the communication associated with said command [Burton, descriptors, col 8 line 56-col 9 line 17, Fig 3D]; and the apparatus is configured to issue read requests to retrieve the portions of the communication described by the set of descriptors and assemble said portions in said assembly area [Burton, assembled for transmission, col 24 line 53-col 25 line 60].

41. As per claim 36, Boyd-Burton disclose a transmit module configured to transmit the communications associated with said receive traffic commands; wherein each communication associated with a receive traffic command is forwarded from said queue to said transmit module after the communication is determined to be complete [Burton, forwarding database, col 6 line 2].

42. As per claim 37, Boyd-Burton disclose a communication is forwarded from said queue to said transmit module by passing to the transmit module a set of pointers delimiting the communication within said queue rather than passing the communication [Burton, forwarding database, col 6 line 2].

43. As per claim 38, Boyd-Burton disclose said queue comprises one or more linked lists of buffers within a memory structure configured to queue receive traffic for multiple communication connections [Boyd, link list, 0129].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong H. Vu whose telephone number is 571-272-3904. The examiner can normally be reached on 6:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, *Lynn Feild* can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thong Vu
Primary Examiner

THONG VU
PRIMARY PATENT EXAMINER